*THE EFFECTS OF VIDEO MODELING WITH VOICEOVER
INSTRUCTION ON ACCURATE IMPLEMENTATION OF
DISCRETE-TRIAL INSTRUCTION*

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The present study replicates and extends previous research on the use of video modeling (VM) with voiceover instruction to train staff to implement discrete-trial instruction (DTI). After staff trainees reached the mastery criterion when teaching an adult confederate with VM, they taught a child with a developmental disability using DTI. The results showed that the staff trainees' accurate implementation of DTI remained high, and both child participants acquired new skills. These findings provide additional support that VM may be an effective method to train staff members to conduct DTI.

Key words: video modeling, discrete-trial instruction, staff training

Video modeling (VM) involves showing a video that exhibits behaviors a viewer should imitate and demonstrate in an appropriate context (Catania, Almeida, Liu-Constant, & Reed, 2009). Previous evaluations using VM alone or in conjunction with other training components (e.g., live instructions, feedback) increased staff integrity in implementing a variety of behavioral protocols (e.g., Lavie & Sturmey, 2002; Moore & Fisher, 2007; Pelletier, McNamara, Braga-Kenyon, & Ahearn, 2010). In a recent evaluation, Catania et al. (2009) evaluated the effectiveness of using VM plus voiceover instructions (hereafter referred to as VM) to train new staff to implement discrete-trial instruction (DTI). Staff members viewed a video demonstrating a match-to-sample session, and after viewing the video, they implemented DTI with a confederate (i.e., an experimenter acting as a child). After implementation of VM, all participants showed substantial increases in performance with a confederate and during single probes with a child. Furthermore, participants demonstrated generalization to novel

teaching protocols (e.g., expressive labeling task). Although this evaluation provides support for the use of VM to train staff to implement DTI, the authors did not evaluate the effect of this training on staff implementation of new protocols to teach children. Thus, it remains unclear whether VM will result in accurate implementation of DTI with children and lead to child skill acquisition.

The present investigation replicated the Catania et al. (2009) study by (a) evaluating the effectiveness of VM to train staff members to implement DTI with a confederate, and (b) measuring accuracy when implementing novel teaching protocols. Moreover, the current study extended Catania et al. by (a) evaluating the extent to which the skills acquired during VM would generalize to the implementation of similar protocols with children in an early intervention program, and (b) measuring skill acquisition of children who receive instruction from staff trainees.

METHOD

Participants and Setting

Three new staff members in an early intervention clinic served as staff trainees during VM. Trainees had no previous experience with

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DTI. During the study, trainees participated in daily observations in the clinic as part of their training as new staff members. During VM, the child probe sessions were conducted with a 5-year 7-month-old child with autism. During child training, staff trainees taught two children who were receiving services in the clinic. Child 1 was 3 years 4 months old and had a primary diagnosis of global developmental delay. Child 2 was 2 years 10 months old and had a diagnosis of pervasive developmental disorder not otherwise specified. All sessions were videotaped and took place in a private room equipped with video recording equipment, a table, chairs, and the materials necessary to conduct each session.

Response Measurement and Interobserver Agreement

The first author viewed videos of all sessions and scored trainees' accuracy in the implementation of DTI components (e.g., establish and wait for ready behavior, provide prompt specified in protocol; a complete list of components and definitions can be obtained from the first author). The first author was not blind to the condition being scored. We calculated the percentage of accuracy by dividing the total number of skills performed correctly by the total number of opportunities to perform a skill and multiplying by 100%.

During child training, the first author also collected data on correct and incorrect child responses. A correct child response was defined as touching the picture card that displayed the target within 5 s of the instruction. An incorrect response was defined as touching a nontarget picture card or not responding within 5 s of the instruction. The percentage of correct child responses was calculated by dividing the number of correct responses by the total number of correct responses plus incorrect responses and multiplying by 100%.

A second observer independently collected data, from video, on trainees' accuracy in the implementation of the DTI components during

VM and child training for a minimum of 36% of sessions in each condition. We calculated interobserver agreement by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100%. Mean agreement was 90% (range, 90% to 99%) across sessions. In addition, two observers collected interobserver agreement data on child correct and incorrect responses for a minimum of 53% of child training sessions. Mean agreement was 92% (range, 83% to 100%) across sessions.

Procedure

We used a concurrent multiple baseline design across participants to evaluate the effects of VM on trainees' accuracy in implementing DTI. During child training, a nonconcurrent multiple baseline design across participants was used to evaluate trainees' accuracy with DTI and child skill acquisition.

Baseline. The trainees received a receptive identification protocol that contained details regarding the teaching procedures (e.g., training targets, prompt procedure, reinforcement schedule), a data sheet, and a set of three picture cards that displayed the targets listed in the protocol. Trainees were given up to 10 min to look over these materials. Next, the experimenters instructed the trainees to do their best at teaching a confederate (i.e., an adult acting as a child) using the protocol as a guide. The second and third authors served as confederates, and neither had a history of training the staff participants. During each 12-trial session, the confederate pseudorandomly engaged in three correct responses (i.e., touching the correct picture card), five incorrect responses (i.e., touching an incorrect picture card), and four no responses (i.e., touching no picture card) after the instruction. A total of 19 additional scripted responses were interspersed pseudorandomly throughout each 12-trial session. The confederate demonstrated the following additional responses: failing to look at the training materials (nine times), stereotypic responses

(five times; e.g., repetitive hand movements), and problem behavior (five times; e.g., loud vocalizations, lightly touching the trainee's arm to simulate aggression).

Trainees also conducted a six-trial probe using a protocol similar to the one described above with a child from the clinic. This child had a diagnosis of a developmental disability, but was not one of the two used in the child training sessions. We conducted child probes to evaluate the trainees' accuracy with a child. During baseline and the six-trial probe, the experimenters did not answer trainees' questions or provide feedback for correct or incorrect implementation of the teaching procedure.

Video modeling. Staff trainees viewed two videos once during the first VM session. The first video (7 min 6 s) provided a model of each DTI component included in training. This video included a voiceover script that introduced the video and an explanation of each of the modeled teaching components. The second video (9 min 39 s) depicted the first author as the teacher and the third author as the child confederate simulating a 12-trial DTI session. The video included a voiceover introduction and brief explanations to highlight important components of the modeled session (voiceover scripts are available from the first author). The receptive identification protocol displayed in the video was the same as the protocol given to trainees during baseline. This video displayed the child confederate engaging in responses identical to those present in baseline but in a different order. After the first VM session, trainees viewed only the second video.

Within 10 min of viewing the video, we provided trainees with a written receptive identification protocol and instructed them to teach a confederate using the protocol as a guide. Procedures were identical to those in baseline. Similar to baseline, the second and third authors served as the confederate during

all VM sessions, but only the third author served as the child confederate on the video. We conducted one to three VM training sessions per day. Video modeling continued until participants implemented DTI with 90% accuracy for two consecutive sessions with the confederates.

Novel teaching protocols. After trainees met criterion with a confederate, we evaluated their accuracy in implementing DTI across novel teaching protocols (i.e., a match-to-sample and an expressive labeling task) using single-session probes with a confederate and a child. As in previous phases, we provided trainees with a written novel teaching protocol, instructed them to teach the confederate or the child using the novel teaching protocol as a guide, and did not provide feedback or answer questions. Trainees did not have access to the videos used during the VM phase.

Child training. Following the novel teaching protocol sessions, each trainee was randomly assigned to teach one of the child participants a receptive identification task. The targets for each child were selected based on treatment goals and were not the same tasks used during the baseline and VM sessions. We provided no instruction or feedback to trainees, nor did they have access to the videos used during VM.

At the start of each child-training session, the experimenters gave the trainees a child-training baseline or prompt-delay receptive identification protocol, a data sheet, and a set of picture cards specific to the protocol. The protocols were similar to those provided during baseline and VM, but contained details regarding the procedure specific to the child and condition (e.g., training targets, prompt procedure, reinforcement schedule). The child-training baseline receptive identification protocol indicated not to provide reinforcement for correct responses or prompts after incorrect responses. The child-training prompt-delay receptive identification protocol described the prompt procedure and reinforcement schedule to be followed.

We instructed trainees to look over the provided protocol and materials for 10 min. Next, the experimenters instructed the trainees to do their best at teaching the child using the protocol as a guide. Training continued until the child emitted correct responses at or above 90% for two consecutive sessions.

RESULTS AND DISCUSSION

Figure 1 depicts the percentage of DTI components implemented accurately by staff trainees with a confederate and during probes with a child. All trainees quickly reached the mastery criterion during VM, and they demonstrated accuracy in implementing novel teaching protocols (e.g., expressive labeling, match to sample) with a child and confederate despite the absence of reinforcement or feedback from the experimenters.

Figure 2 displays the trainees' accuracy in DTI implementation and correct child responses during child training. Results indicated that the trainees' accuracy remained high during child training. Furthermore, the child participants reached the mastery criterion for the skills targeted during teaching.

These results replicate those of Catania *et al.* (2009), which showed that VM was effective in increasing staff trainees' accuracy in implementing DTI. Furthermore, these results extend previous research by demonstrating the maintenance of trainees' accuracy when implementing DTI with a child and the associated skill acquisition of children during the child-training sessions. Together, these results provide additional evidence to support the use of VM to train staff.

Some limitations should be noted. We did not collect baseline data on trainee accuracy when implementing the novel teaching protocols. In addition, trainees spent time observing in an early intervention classroom throughout the study. Thus, it is possible that they observed other staff members implementing DTI, although the current staff members were directed not to provide trainees with instruction related

Figure 1. The percentage of DTI components implemented accurately by Janice, Marissa, and Rose in baseline, video modeling, and novel teaching protocols. EXP LAB = expressive labeling; MTS = match to sample.

to DTI implementation. The large increase in the trainees' accuracy immediately after the implementation of VM suggests that the intervention was responsible for improvements in performance.

A final limitation is that experimental control was limited during child training, because we did not wait for child correct responding to increase before implementing intervention with another child. Future studies could use a concurrent multiple baseline design across participants to demonstrate experimental control more adequately.

Results of the present study support several avenues for future research. Future studies could

Figure 2. The percentage of DTI components implemented accurately by Marissa, Janice, and Rose during child training, and the percentage of correct child responses by Child 1 and Child 2.

address whether the voiceover component on the video is necessary for training, or what aspects of the voiceover instruction are most salient in improving staff behavior. Future

evaluations also could examine the effectiveness of using a single video during all training sessions instead of the two videos used in the current study.

Additional studies could directly compare the training time and efficiency across VM and in vivo procedures. Furthermore, gaps in the literature regarding best practices in using VM for training warrant additional research. More specifically, a better understanding of the optimal characteristics of videos (e.g., video length, latency between viewing video and implementing protocols) may help guide clinicians in the development and use of VM.

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